P-4.1 Recognize the characteristics of static charge and explain how a static charge is generated

Revised Taxonomy Levels **1.1 Ab** **Recognize knowledge of terminology**
2.7 B **Explain conceptual knowledge**

Key Concepts

In physical science students "explain how objects can acquire a static electric charge through friction, induction, and conduction." Physical science students understand that static charge is acquired when electrons move, causing there to be an imbalance in the number of protons and electrons.

It is essential for all students to

- Understand that static electricity is stationary electricity in the form of an electric charge at rest
- Understand the basic law of electrostatics "Objects that are similarly charged repel each other; objects that are oppositely charged attract each other."
- Understand that a negatively charged object has a net excess of electrons and a positively charged object has a net deficit of electrons.
- Understand the processes of conduction and induction
- Explain the behavior of an electroscope based on an understanding of conduction, induction, and the law of electrostatics.

Assessment

The revised taxonomy verb, recognize, means that the major emphasis of assessment should be for students to "locate knowledge in long-term memory that is consistent with presented material". In the case of this indicator, students should be able to remember the characteristics of static charge and be able to apply those concepts to laboratory apparatus such as an electroscope or a Van de Graff generator and to familiar circumstances.

The verb, explain, means that the major focus of assessment should be for students to "construct a cause and effect model". In this case, assessments will ensure that students can model how objects acquire static electric charge either by induction or conduction. Because the indicator is written as conceptual knowledge, assessments should require that students understand the "interrelationships among the basic elements within a larger structure that enable them to function together." In this case, assessments must show that students can construct a cause and effect statement relating how given behaviors (such as touching a charged electroscope with your finger) will affect the electroscope and explain that behavior on the basis of static charge.